CLAIMS

1. A method for obtaining mastocytes, the method comprising the step of culturing bone-marrow stem cells in a culture medium comprising at least about 0.2 ng/ml of IL-3, at least about 8 ng/ml of SCF, at least about 0.1 ng/ml of IL-4, and at least one mediator selected from the group consisting of at least about 10 ng/ml of IL-6 and at least about 1 ng/ml of G-CSF.

2. The method of claim 1, wherein the mediator is at least about 10 ng/ml of IL-6.

3. The method of claim 1, wherein the mediator is at least about 1 ng/ml of G-CSF.

4. The method of claim 1, wherein the mediator is at least about 10 ng/ml of IL-6 and at least about 1 ng/ml of G-CSF.

5. The method of claim 1, wherein the bone marrow stem cells are porcine bone-marrow stem cells.

6. The method of claim 5, wherein the bone-marrow stem cells are obtained from pigs of between about 2 days old and about 6 weeks old.

7. The method of claim 1, wherein the bone-marrow stem cells are human-fetal bone-marrow stem cells.

8. The method of claim 1, further comprising the step of maintaining the bone-marrow stem cells in the medium for at least about 30 days.

9. Porcine mastocytes obtained from the method of claim 5.

10. Porcine mastocytes that produce heparin-type molecules in which the amount of Is disaccharides is greater than the amount of IIs disaccharides, the

amount of IIs disaccharides is greater than the amounts of IIIs disaccharides, and the amount of IIIs disaccharides is greater than the amount of Ivs disaccharides.

11. Porcine mastocytes of claim 10 that produce heparin-type molecules comprising at least 30% of Is disaccharides.

12. Porcine mastocytes of claim 10 that produce heparin-type molecules exhibiting a ratio between the IIs and IIIs disaccharides of between about 0.5 and 5.

13. Porcine mastocytes of claim 10 that produce at least 0.1 μg of heparin-type molecules/10^6 cells.

14. Porcine mastocytes of claim 10 that produce heparin-type molecules exhibiting a ratio between the Is and IIs disaccharides of between about 3 and 8.

15. Porcine mastocytes of claim 10 that produce heparin-type molecules exhibiting an anti-Xa activity greater than at least 10 IU/mg.

16. Porcine mastocytes of claim 10 that produce heparin-type molecules exhibiting an anti-IIa activity greater than at least 10 IU/mg.

17. A porcine mastocyte line deposited with the Collection de Cultures de Microorganismes of the Institut Pasteur on April 09, 2003, under the no. I-3010.

18. A porcine mastocyte line deposited with the Collection de Cultures de Microorganismes of the Institut Pasteur on April 09, 2003, under the no. I-3011.

19. A porcine mastocyte line deposited with the Collection de Cultures de Microorganismes of the Institut Pasteur on April 09, 2003, under the no. I-3012.

20. A porcine mastocyte line deposited with the Collection de Cultures de Microorganismes of the Institut Pasteur on April 09, 2003, under the no. I-3013.

21. A porcine mastocyte line deposited with the Collection de Cultures de Microorganismes of the Institut Pasteur on April 09, 2003, under the no. I-3014.

22. Porcine mastocytes of claim 10, wherein the porcine mastocytes comprise a nucleic acid encoding an immortalizing protein.

23. Porcine mastocytes of claim 11, wherein the porcine mastocytes comprise a nucleic acid encoding an immortalizing protein.

24. Porcine mastocytes of claim 12, wherein the porcine mastocytes comprise a nucleic acid encoding an immortalizing protein.

25. Porcine mastocytes of claim 10, wherein the porcine mastocytes comprise a nucleic acid encoding c-kit.

26. Porcine mastocytes of claim 11, wherein the porcine mastocytes comprise a nucleic acid encoding c-kit.

27. Porcine mastocytes of claim 10, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

28. Porcine mastocytes of claim 11, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

29. Porcine mastocytes of claim 12, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

30. Porcine mastocytes of claim 13, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

31. Porcine mastocytes of claim 14, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

32. Porcine mastocytes of claim 15, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

33. Porcine mastocytes of claim 16, wherein the porcine mastocytes comprise a nucleic acid encoding T antigen.

34. Porcine mastocytes of claim 10, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

35. Porcine mastocytes of claim 11, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

36. Porcine mastocytes of claim 12, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

37. Porcine mastocytes of claim 13, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

38. Porcine mastocytes of claim 14, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

39. Porcine mastocytes of claim 15, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

40. Porcine mastocytes of claim 16, wherein the porcine mastocytes comprise a nucleic acid encoding an enzyme which acts on the sulfation of the heparin-type molecules.

41. Porcine mastocytes of claim 10, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

42. Porcine mastocytes of claim 11, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

43. Porcine mastocytes of claim 12, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

44. Porcine mastocytes of claim 13, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

45. Porcine mastocytes of claim 14, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

46. Porcine mastocytes of claim 15, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

47. Porcine mastocytes of claim 16, wherein the porcine mastocytes comprise a nucleic acid encoding a 3-OST.

48. A method for producing heparin-type molecules, the method comprising the step of culturing the porcine mastocytes of claim 10.

49. A method for producing heparin-type molecules, the method comprising the step of culturing porcine mastocytes in a culture medium comprising at least approximately 0.1 ng/ml of IL-4.

50. A method for producing heparin-type molecules, the method comprising the steps of obtaining porcine mastocytes overexpressing IL-4, and culturing the mastocytes in a culture medium.

51. A method for producing heparin-type molecules, the method comprising the steps of obtaining porcine mastocytes transfected with a nucleic acid encoding IL-

4, and culturing the mastocytes in a culture medium.

52. A protein of porcine origin of the c-kit type, the protein comprising a C-terminal end having the sequence of SEQ ID NO. 3.

53. The protein of claim 53, the protein comprising a sequence having at least 99% identity with the sequence of SEQ ID NO. 2.

54. A nucleic acid comprising a sequence encoding the protein of claim 53.

55. A nucleic acid comprising a sequence encoding the protein of claim 54.

56. The nucleic acid of claim 55, comprising a sequence exhibiting at least 99% identity with the sequence of SEQ ID NO. 1.

57. The nucleic acid of claim 56, comprising a sequence exhibiting at least 99% identity with the sequence of SEQ ID NO. 1.

58. A cell comprising the nucleic acid of claim 55.

59. A cell expressing the protein of claim 53.

60. A protein of porcine origin exhibiting 3-O-sulfatase activity.

61. The protein of claim 61, the protein comprising a sequence exhibiting at least 95% identity with the sequence of SEQ ID NO. 4.

62. A nucleic acid comprising a sequence encoding the protein of claim 61.

63. A nucleic acid comprising a sequence encoding the protein of claim 62.

64. The nucleic acid of claim 63, the nucleic acid comprising a sequence exhibiting at least 95% identity with the sequence SEQ ID NO. 5.

65. The nucleic acid of claim 64, the nucleic acid comprising a sequence exhibiting at least 95% identity with the sequence SEQ ID NO. 5

66. A cell comprising the nucleic acid of claim 63.

67. A cell expressing the protein of claim 61.

68. A protein of porcine origin exhibiting 6-O-sulfatase activity.

69. The protein of claim 69, wherein the protein comprises a sequence exhibiting at least 90% identity with the sequence SEQ ID NO. 6.

70. A nucleic acid comprising a sequence encoding the protein of claim 69.

71. A nucleic acid comprising a sequence encoding the protein of claim 70.

72. The nucleic acid of claim 71, wherein the nucleic acid comprises a sequence exhibiting at least 95% identity with the sequence SEQ ID NO. 7.

73. The nucleic acid of claim 72, wherein the nucleic acid comprises a sequence exhibiting at least 95% identity with the sequence SEQ ID NO. 7

74. A cell comprising the nucleic acid of claim 71.

75. A cell expressing the protein of claim 69.